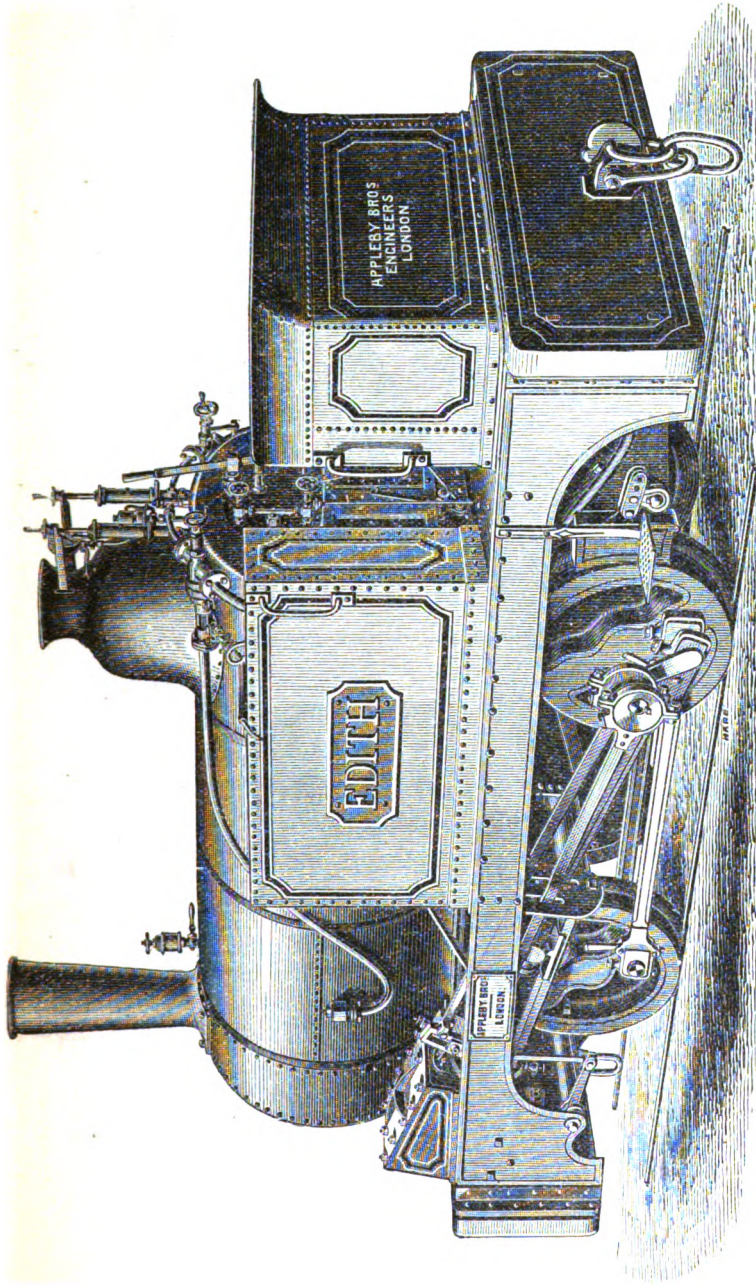


LIGHT LOCOMOTIVES,

FOR CONTRACTORS, OR FOR PASSENGER, GOODS, OR MINERAL TRAFFIC.*



The Engine illustrated has outside Cylinders 8 in. diameter with 15 in. stroke, placed at an angle of 1 in 5, and it is carried on two pairs of coupled wheels, 2 ft. 3 in. in diameter, with cast-steel tyres, and 5 ft. centre to centre; this short wheel base is adopted to enable the Engine to traverse freely the sharp curves met with on the line. The Boiler has a copper fire-box, and is fitted with 72 brass tubes; the total heating surface being 141 square feet; and the grate area 5'13 square feet. The Springs are placed between the inside and outside frames; the gauge is 2 ft. 8 in., but the same general design is carried out for any gauge up to 4 ft. 8½ in., and the style of finish throughout is that of the best class of locomotive work.

Prices, with full specification of this and various other sizes, may be had on application.

• *Vide* 'Engineering,' Vol. II., No. 264. January 20th, 1871.

APPLEBY BROTHERS,

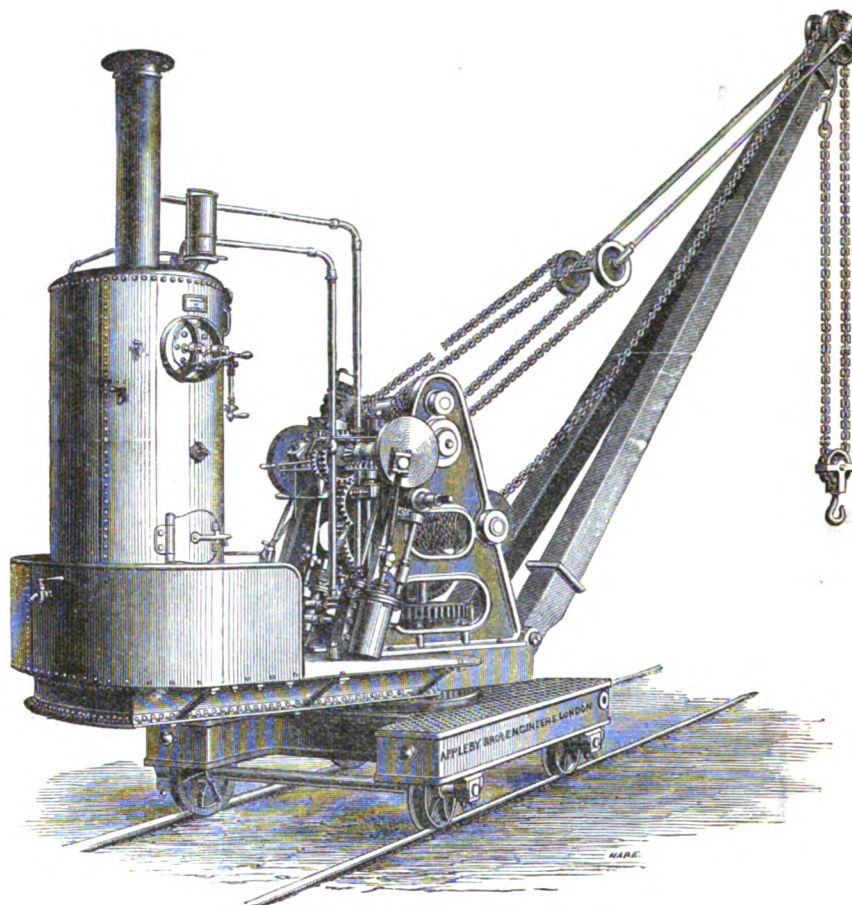
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

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LOCOMOTIVE STEAM-CRANE, WITH STEAM DERRICK MOTION.

PRIZE MEDALS.—PARIS, 1867, AND VIENNA, 1873.

No. 41.



These Cranes are easily worked by one man; and the working expenses in London, including driver, fuel, oil, wipings, &c., is about 12s. per day; the average daily work done by the small Cranes during several months having been 300 tons lifted 30 feet high and deposited in trucks.

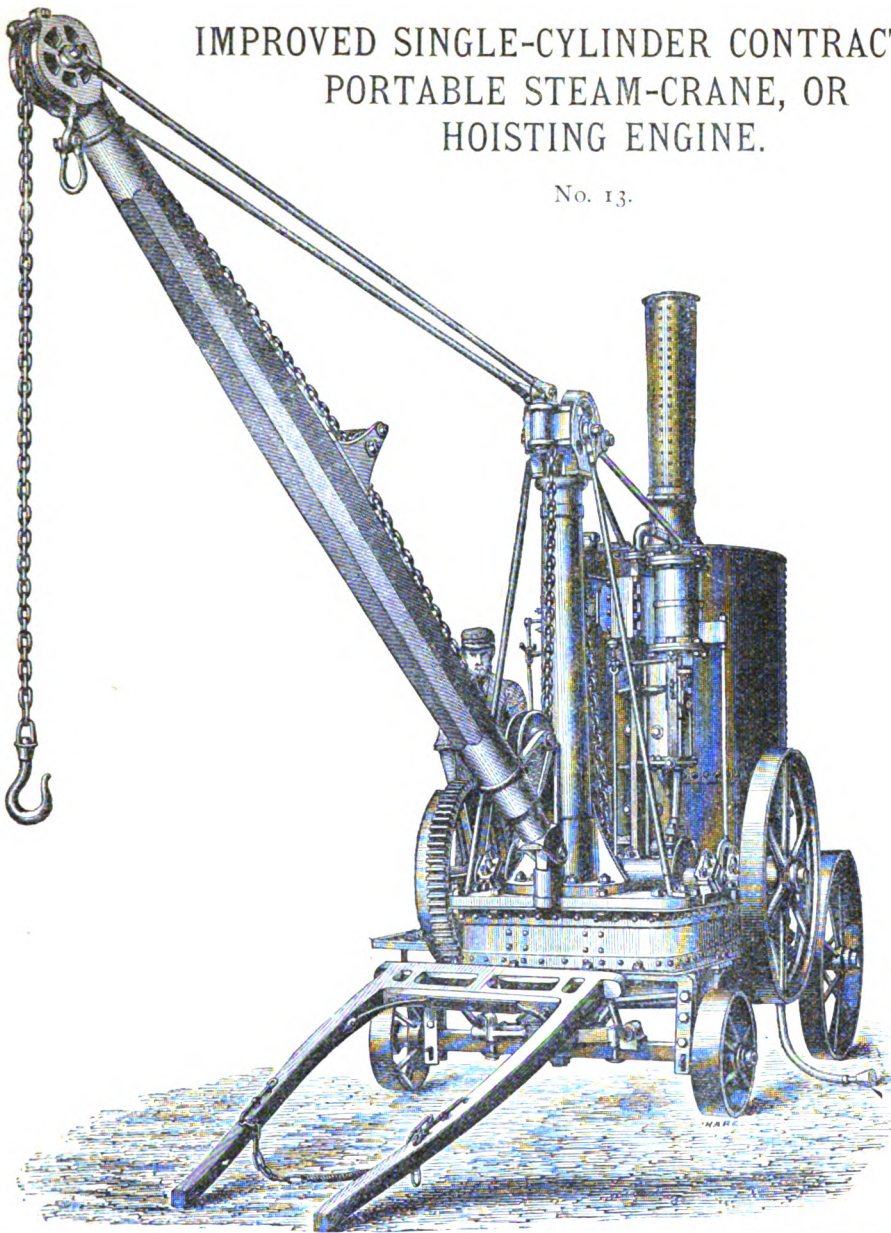
No.	With 2 Cylinders, to lift.. .. .	2 Tons.	3 Tons.	5 Tons.	7 Tons.	10 Tons.
40	Lifts and turns by steam	£ 360	£ 410	£ 540	£ 600	£ 800
41	Lifts, turns, and alters radius; all by steam	380	430	565	625	830
42	Jib of fixed radius, lifts, turns, and travels by steam ..	..	435	570	630	840
43	Lifts, turns, travels, and alters radius by steam ..	..	450	590	650	870
	To lift and travel by hand extra	5	5	5	6	7
	Rail Clips, per set of four „	5	6	6	7	8
	Lagging, Felting, and Covering Boiler with Sheet Iron extra	13	15	15	16	16
	Galvanized Iron House „	20	25	27	30	33
	Approximate weight (tons)	8	10½	13½	16½	20

Stoking tools, 25s. Fitters' tools, £2 extra. Hand Feed-Pump extra, £8 10s. Packing for Shipment, 3 per cent.

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

IMPROVED SINGLE-CYLINDER CONTRACTOR'S PORTABLE STEAM-CRANE, OR HOISTING ENGINE.

No. 13.



NOMINAL HORSE-POWER	SINGLE CYLINDER.					DOUBLE CYLINDER.		
	3	4	6	8	12	6	8	12
Diameter of Cylinder	5½ in.	6½ in.	7½ in.	9 in.	11 in.	5½ in.	6½ in.	7½ in.
Price with Road Wheels, Shafts, and Locking Plate	£ 190	£ 228	£ 200	£ 295	£ 370	£ 286	£ 355	£ 415
„ Plain or Flanged Wheels for Trams or Railway (without Shafts and Locking Plate)	185	223	235	289	360	281	350	405
„ Without Wheels and Axles (for fixing on timber, brick, or other foundations)	180	218	249	282	352	275	343	397
Extra for Governors and Expansion Valve	10	12	13	20	25	15	20	25
„ Link-Motion Reversing Gear	7	8	10	11	12	15	18	20
„ Felting, Lagging, and Covering Boiler with Sheet Iron	10	12	13	15	16	13	15	17
„ Skeleton Roof	8	9	10	10	10	10	10	10
„ Packing for Shipment	7	8	9	10	12	9	10	12
Approximate weight (tons)	3½	4½	5	7½	8½	4	7½	8½

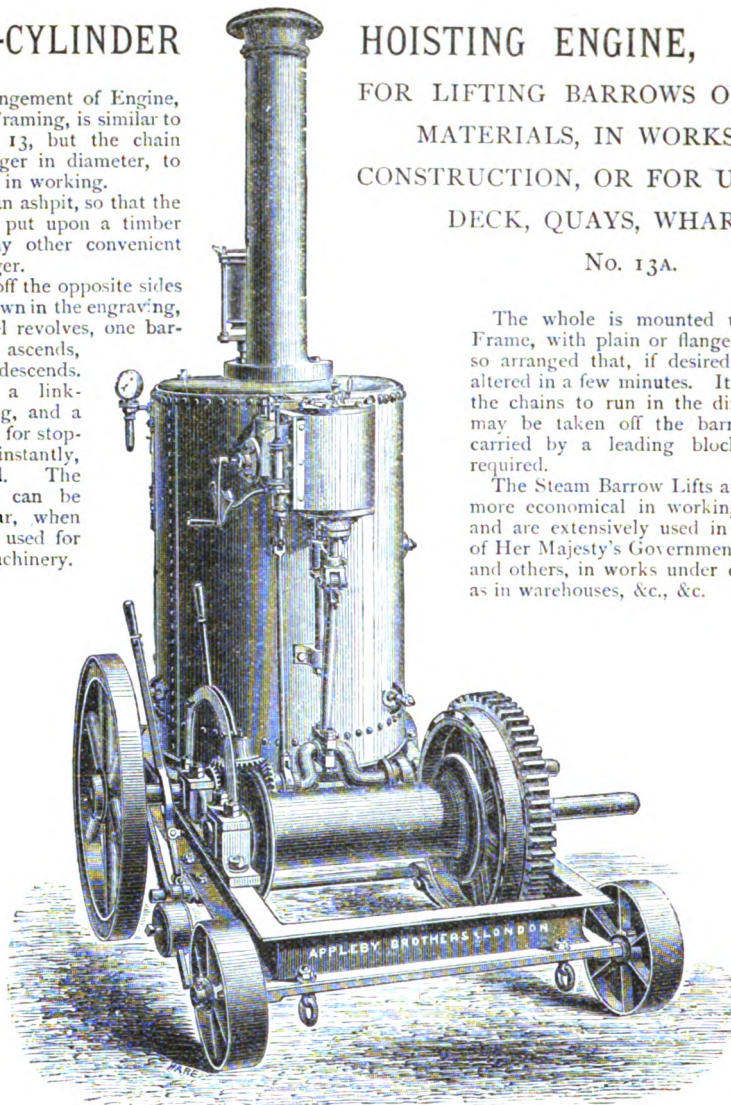
APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

SINGLE-CYLINDER

The general arrangement of Engine, Boiler, Gear, and Framing, is similar to Steam Crane No. 13, but the chain barrel is made larger in diameter, to obtain a high speed in working.

The Boiler has an ashpit, so that the barrow lift can be put upon a timber staging, or in any other convenient place, without danger.

The chain leads off the opposite sides of the barrel, as shown in the engraving, so that as the barrel revolves, one barrow, sack, &c., ascends, whilst the other descends. The Engine has a link-motion for reversing, and a powerful foot-brake for stopping the Engine instantly, whenever required. The winding apparatus can be thrown out of gear, when the Engine can be used for driving ordinary machinery.



HOISTING ENGINE,

FOR LIFTING BARROWS OR BUILDING MATERIALS, IN WORKS UNDER CONSTRUCTION, OR FOR USE ON SHIP'S DECK, QUAYS, WHARFS, &c.

No. 13A.

The whole is mounted upon a strong Iron Frame, with plain or flanged wheels, which are so arranged that, if desired, the gauge may be altered in a few minutes. It is not necessary for the chains to run in the direction shown; they may be taken off the barrel horizontally, and carried by a leading block in any direction required.

The Steam Barrow Lifts are much quicker and more economical in working than horse-power, and are extensively used in various departments of Her Majesty's Government, and by contractors and others, in works under construction, as well as in warehouses, &c., &c.

	SINGLE CYLINDER.					DOUBLE CYLINDER.		
NOMINAL HORSE-POWER	3	4	6	8	12	6	8	12
Diameter of Cylinder	5½"	6½"	7½"	9"	11"	5½"	6½"	7½"
Price, with Plain or Flanged Wheels for Tram or Rails (without Shafts and Locking Plate) as shown ..	£ 155	£ 195	£ 220	£ 245	£ 315	£ 250	£ 288	£ 360
„ Without Wheels and Axles (for fixing on brick or timber)	150	190	214	238	307	244	281	352
„ With Road Wheels, Shafts, and Locking Plate ..	160	202	228	255	325	255	295	370
Extra for Governors and Expansion Valve	10	12	13	20	25	15	20	25
„ Link-Motion Reversing Gear	7	8	10	11	12	15	18	20
„ Felting, Lagging, and Covering Boiler with Sheet Iron	10	12	13	15	16	13	15	17
„ Skeleton Roof	8	9	10	10	10	10	10	10
„ Packing for Shipment	6	7	8	9	10	8	9	10
Approximate weight (tons)	2½	3½	3½	5½	7½	3½	6	7½

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

APPLEBY'S IMPROVED STEAM PILE-DRIVING MACHINE. No. 15A.

The advantages claimed for these machines are their cheapness, compactness, and adaptability for a variety of work.

The boiler, which is of ample power and strength, may be mounted on the frame (as shown in the engraving), or it may be placed in any convenient position, and connected with the engine by a wrought-iron pipe, to dispense with the flexible hose, which is liable to fracture unless used with great care.

This apparatus is frequently applied to the ordinary hand piling engine in a few hours, and at little cost beyond that of the boiler and engine work.

The general arrangement of the pile driver is shown in the engraving, sufficiently to render it perfectly intelligible with the following short explanation:

The "monkey" or ram, and the chain, are the same as those used for the ordinary hand-engines; the "nippers" only are specially adapted for the greater speed required when working by steam, so that the ram will make 10

strokes per minute, or less, in proportion to the fall required.

The machine may be set to drive piles at any convenient angle with its base, and the pile is pitched into its position for driving, by the chain in a very short time, without a rope.

As the ram will drive as low as the base of the engine, the "dolly" is not required.

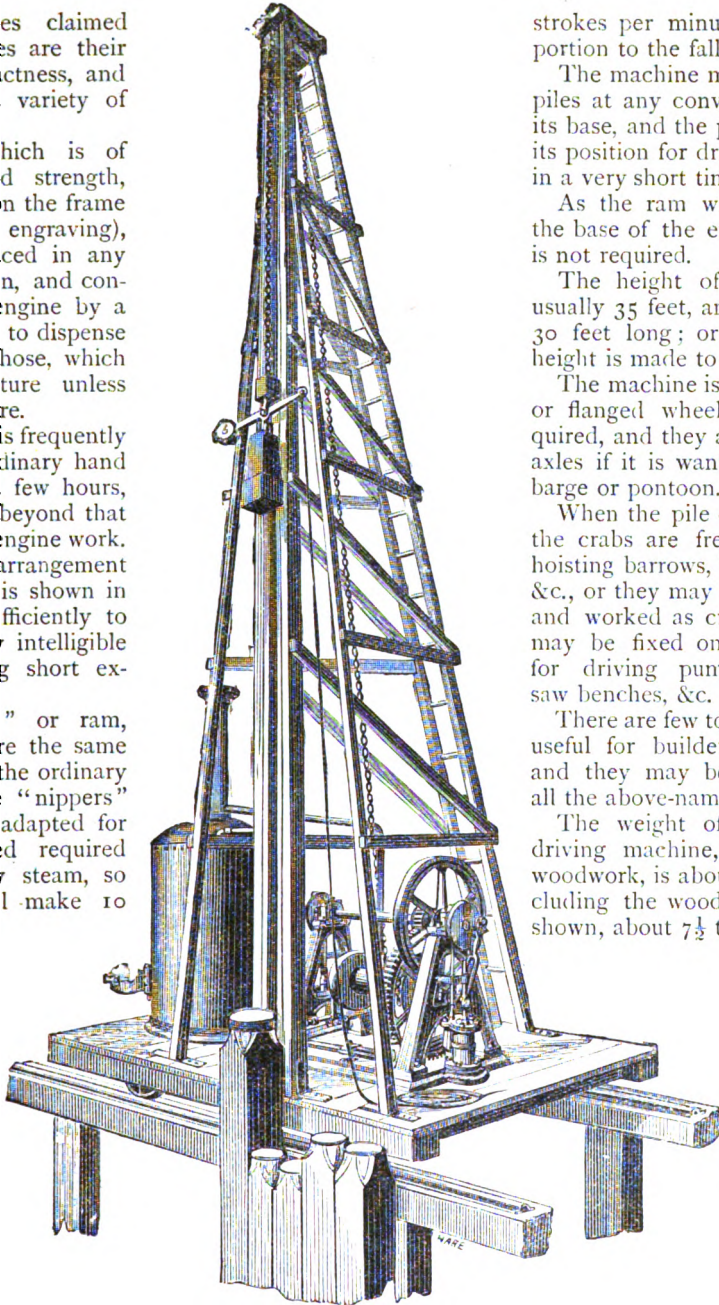
The height of the machine is usually 35 feet, and will drive a pile 30 feet long; or a greater or less height is made to order.

The machine is mounted on plain or flanged wheels, as may be required, and they are slipped off the axles if it is wanted to work on a barge or pontoon.

When the pile driving is finished, the crabs are frequently used for hoisting barrows, building materials, &c., or they may be fitted with jibs, and worked as cranes; or a pulley may be fixed on the engine shaft, for driving pumps, mortar pans, saw benches, &c.

There are few tools more generally useful for builders or contractors, and they may be seen in work for all the above-named purposes.

The weight of the steam pile-driving machine, but exclusive of woodwork, is about $4\frac{1}{4}$ tons, and including the woodwork, complete as shown, about $7\frac{1}{2}$ tons.

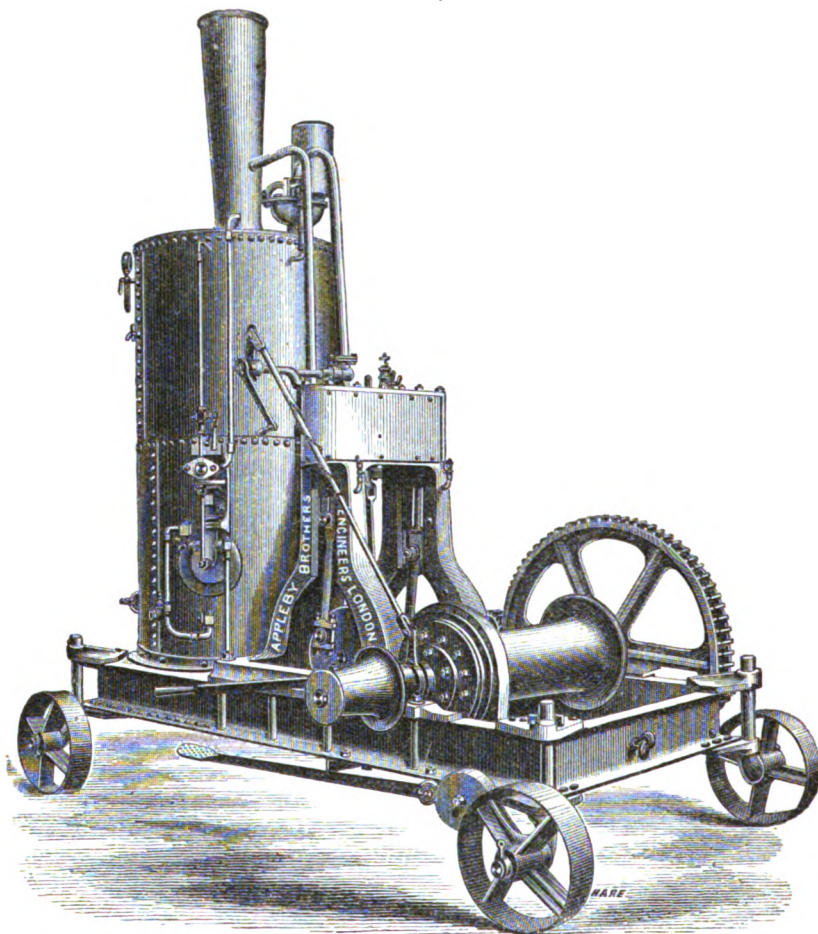


No. 15A, price complete, with woodwork	£270	0	0
Price of the CRAB or WINCH, with Block Brake, for Pile Driving, and also with Strap Brake for general hoisting purposes	105	0	0
Price of the CRAB, with BOILER, Feed Pump, and all connections, as shown	200	0	0
One-Ton Monkey Patent Nippers, Top Sheave and Bearings, and 80 feet of Best Tested Chain	26	0	0
Two pairs of Wheels and Axles, with Bearings	10	0	0

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

APPLEBY'S IMPROVED STEAM PILE-DRIVER.

No. 15B.



The improvements in this arrangement of machinery admit of a larger number of blows being made per minute than can be obtained by any other system employing the single rope or chain ; and the whole of the parts have been designed with a view of obtaining the greatest rigidity and strength, so as to reduce wear and tear to a minimum.

The lifting gear is of single purchase, and is usually proportioned for working with a monkey not exceeding one ton in weight. The barrel is loose on the shaft, and is made fast to it by a powerful conical friction clutch, which is thrown in and out of contact with the barrel by the hand lever shown in the engraving ; this lever is also connected by a rod to the throttle valve, which automatically regulates the supply of steam.

The capstan end is used for pitching piles or hauling ; and the strap brake is worked by the foot lever, and used for preventing the chain from overhauling too much, or for holding the load.

The boiler is of ample power, and is fitted with all steam and furnace mountings, and feed pump.

The engine has been specially designed for driving piles with a machine of the ordinary type (as shown at No. 15A).

Price, with two 6-inch Cylinders complete, £280. Weight, about 5½ tons.

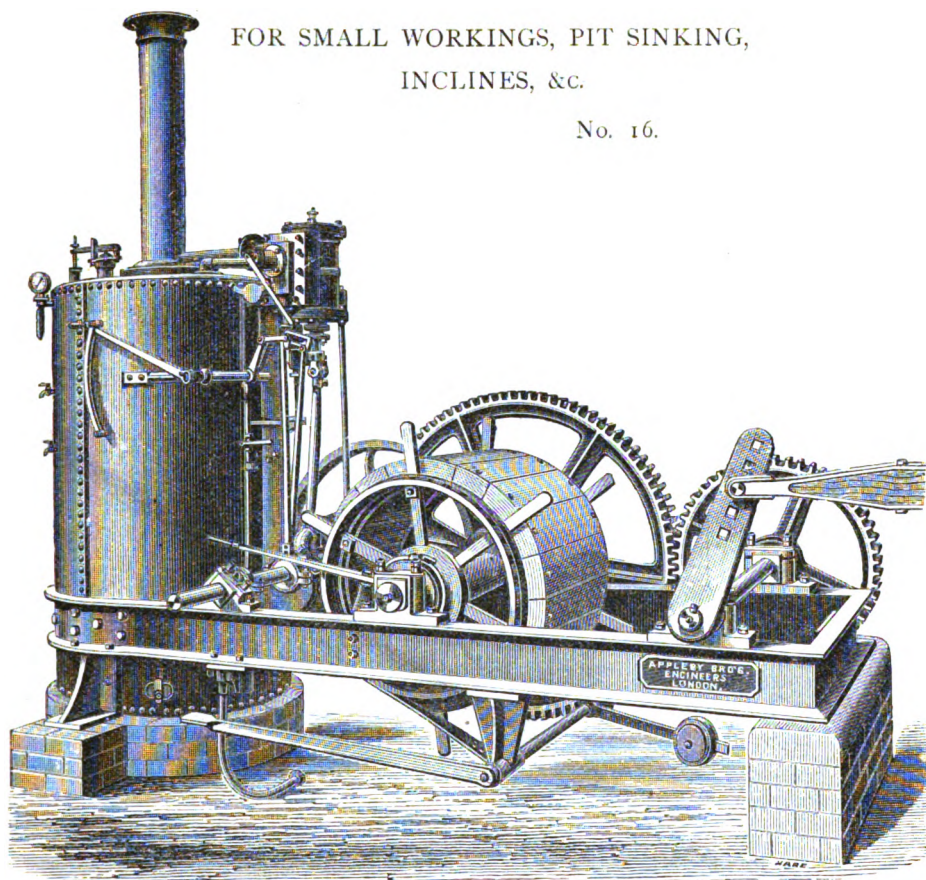
Packing for Shipment extra.

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

SINGLE-CYLINDER WINDING AND PUMPING ENGINE,

FOR SMALL WORKINGS, PIT SINKING,
INCLINES, &c.

No. 16.



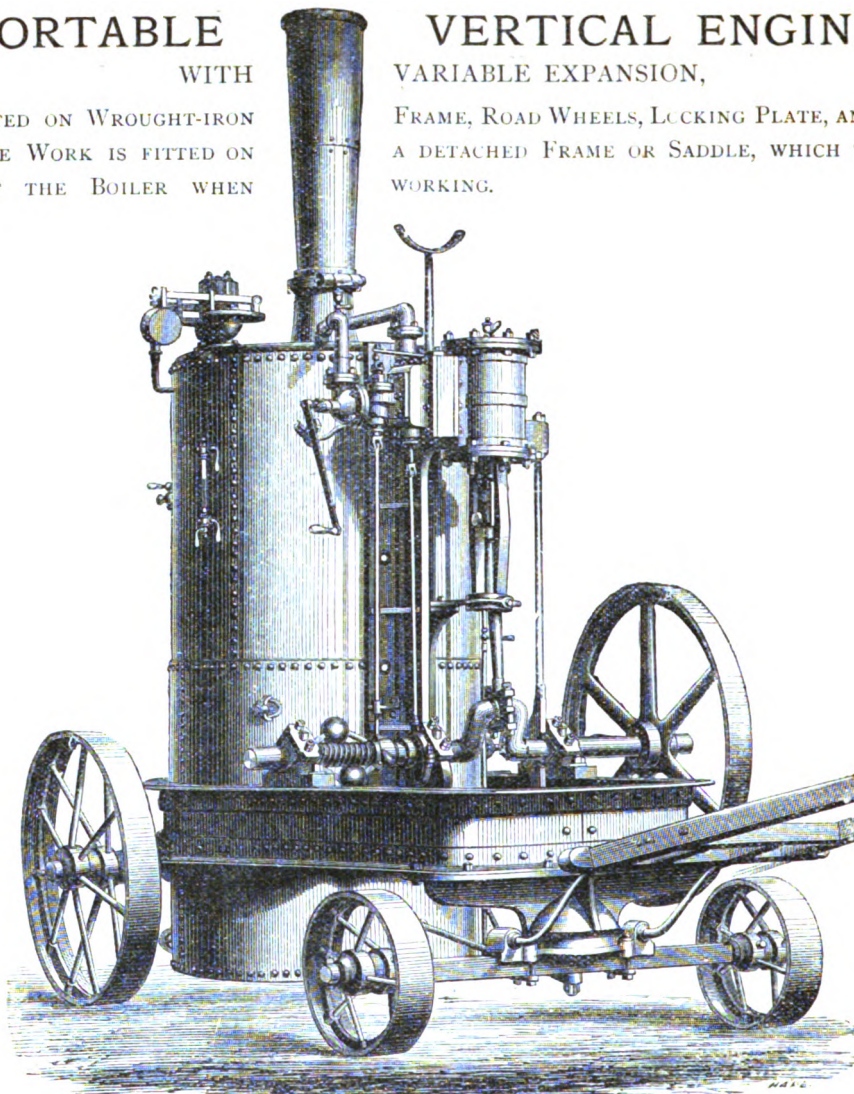
The Boiler with all fittings, the Engine with reversing motion, and the Gearing with foot brake, are mounted on a strong iron frame, and the whole can be readily removed; the Drum is made with wrought-iron arms and wood lagging for any kind of rope, and has been speeded to run, according to circumstances, at from 50 to 300 feet per minute, and the pumping gear from 8 to 40 strokes per minute; provision is made for throwing out of gear either the winding drum or the pumping arm, as occasion may require.

Although originally made for small workings widely separated, where manual labour was expensive, and where a large outlay in machinery was undesirable, these Engines have been found to give such satisfactory working results that they have been made of almost every size from 3 to 30 horse-power (nominal), and with one or two cylinders.

COMPLETE WITH FEED PUMP.					Diameter of Cylinder.	Price as shown.	If without Pumping Arm and Gear.	Extra, if Lock- ing Plate, Road Wheels, and Shafts.
3 horse-power, as per Engraving	..	..	..	..	inches.	£	£	£
4 " " "	5 $\frac{1}{2}$	170	165	10
6 " " "	6 $\frac{1}{2}$	205	198	12
8 " " "	7 $\frac{1}{2}$	230	220	15
10 " " "	9	285	270	20
12 " " "	10	325	305	20
	11	370	345	25

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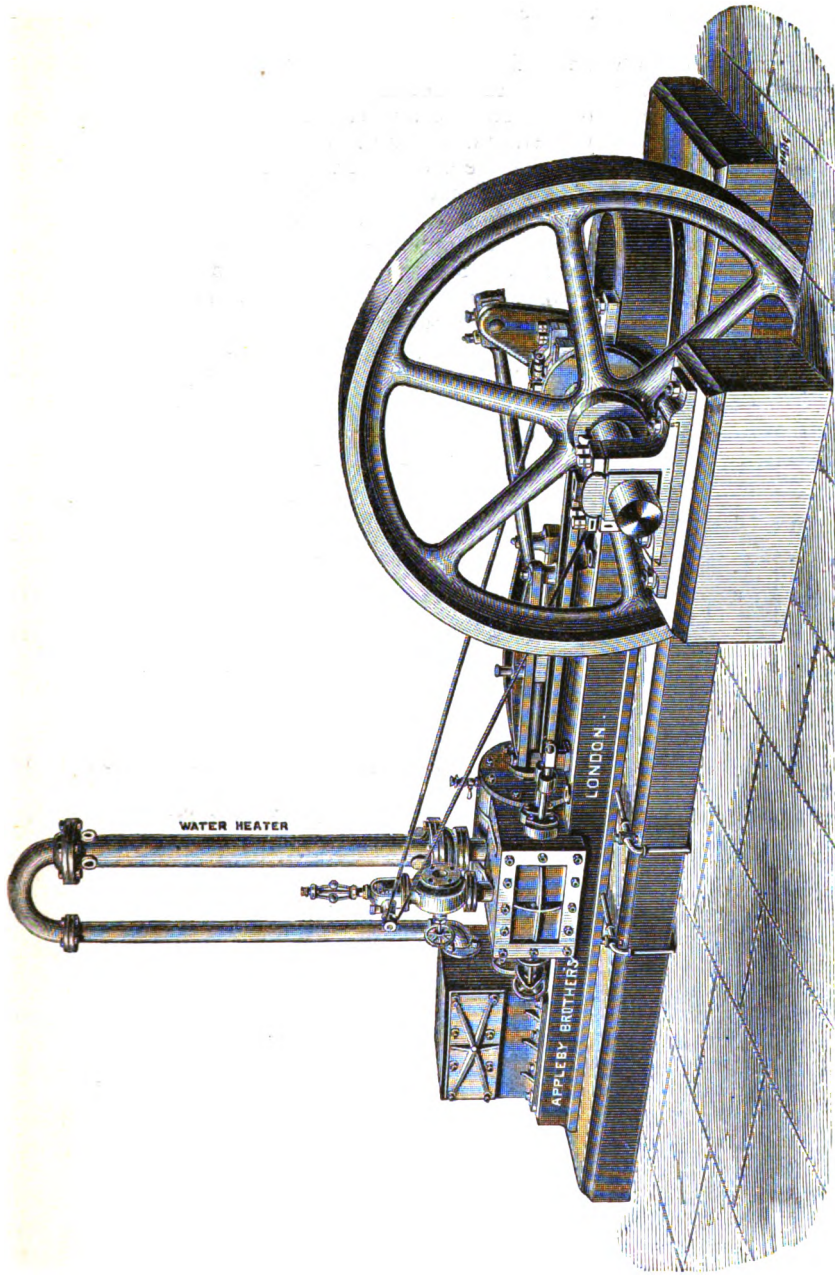
PORTABLE **VERTICAL ENGINE,**
 WITH VARIABLE EXPANSION,
 AND MOUNTED ON WROUGHT-IRON FRAME, ROAD WHEELS, LOCKING PLATE, AND SHAFTS.
 THE ENGINE WORK IS FITTED ON A DETACHED FRAME OR SADDLE, WHICH TAKES ALL
 STRAIN OFF THE BOILER WHEN WORKING.



PORTABLE.	SINGLE CYLINDER.						DOUBLE CYLINDERS.		
NOMINAL HORSE-POWER	3	4	6	8	10	12	6	8	12
Diameter of Cylinder	5½	6½	7½	9	10	11	5½	6½	7½
Engine, with Governors, as shown Price	£117	£163	£202	£241	£280	£320	£230	£281	£365
Extra for Link-Motion Reversing Gear	7	8	10	11	12	12	15	18	20
Extra for Felted, Lagging, and Covering Boiler } with Sheet Iron	10	12	13	15	16	16	13	15	17
Approximate weight in tons	2	2½	3½	3¾	4½	4¾	3½	4	5
Approximate measurement in cubic feet	150	160	300	380	450	500	300	390	510

Packing for short voyages costs about 3 per cent. ; and for long voyages about 5 per cent.
 Engines under 8 horse-power are not fitted with the variable expansion valve.

APPLEBY BROTHERS,
 ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

Horizontal High-pressure and Condensing Steam Engine.

The greatly increased cost of fuel, and the growing demand for Engines which shall be cheap in use, rather than in first cost, has led to the production of the design shown in the accompanying Engraving, in which the details of construction have been most carefully considered; and the high duty which has been obtained from Engines of this construction fully demonstrates that COMMERCIAL ECONOMY IS TO BE FOUND IN PERFECTION OF DESIGN AND WORKMANSHIP RATHER THAN IN A LOW FIRST COST.

The Cylinders are fitted with steam jackets and are lagged and felted; the valve chest is the full length of the Cylinder, with double sets of ports and valves at each end, saving the filling of the long steam-ports at each stroke; the valve motion is adjustable to any point of cut-off, whilst running, by the small hand-wheel at the back of slide jacket, and an index shows the point of cut-off; the glands are all of great length, bushed with gun metal; the guide bars are double, and the guide blocks of great length; the bottom guide bars are planed to form an oil channel for the blocks to work in. The centre line of the Engine is brought

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ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

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Horizontal High-pressure and Condensing Steam Engine—continued.

down as nearly as possible to the level of the bed plate. The connecting rod is of the proportion of about $2\frac{1}{2}$ to 1 of the stroke of the Engine, and is of forged scrap-iron, the crank-pin end being solid and fitted with gun-metal bearing, adjusting key, and lubricator; the cross-head end is also fitted with gun-metal bearing, cotters, and lubricators. The crank shaft and crank is of hammered iron, forged solid, and shaped all over.

The cross-head is of scrap iron, cotttered to the steel piston-rod. The bearings of the crank shaft are of gun metal made of great length, giving a large area of bearing surface, and are adjustable in all directions. The fly wheel is of ample weight, turned on face and edges. The Condenser and air pump are placed on the bed plate behind the Cylinder, and the air-pump piston is coupled direct to the steam piston; the rod of which is continued through the back cover. The air pump in the large sizes is double acting, and is fitted with metallic piston, gun-metal grid, valves and guards, and india-rubber discs, injection cock and pipe. The feeding pump is worked from the cross-head, and is fitted with gun-metal clack boxes and valves, and is placed on the opposite side of Cylinder to valve jacket. An improved water heater can be fitted between the exhaust branch on the Cylinder and the Condenser, capable of raising the water drawn from the hot well at about 80° to 100° before entering the boiler. An improved high-speed governor regulates the speed of the Engine, or if desired it can be attached to the valve motion, so as to make the cut-off automatic, at a slightly increased cost beyond that given in annexed list. The smallest sizes of Engines in list, up to 10 horse-power, have only one set of ports in middle of Cylinder, and the air pump is single acting.

HIGH-PRESSURE AND CONDENSING ENGINE.

Horse-power of Engine ..	6 H.-p.	8 H.-p.	10 H.-p.	12 H.-p.	16 H.-p.	20 H.-p.	25 H.-p.	30 H.-p.	35 H.-p.	40 H.-p.	50 H.-p.
Diameter of Cylinder ..	8 in.	9 in.	11 in.	12 in.	14½ in.	16 in.	18 in.	20 in.	21 in.	22 in.	24 in.
Price of Engine only ..	£ 120 0	£ 147	£ 170 0	£ 236	£ 278 0	£ 336	£ 420	£ 475	£ 530	£ 600	£ 690
„ Feed Pump, EXTRA	5 5	6	7 5	8	9 12	12	15	18	21	24	30
„ Expansion Gear, EXTRA ..	8 0	10	12 0	14	16 0	20	25	30	35	40	50
„ Engine and Cornish Boiler, with Feed Pump and fittings complete, as described (Expansion Gear not included)	216 0	272	310 0	405	490 0	600	750	860	940	1030	1190

One of these Engines can be inspected in work at Messrs. APPLEBY BROTHERS' Works, Emerson Street, Southwark.

THE PATENT EVAPORATIVE SURFACE-CONDENSER.

Where water is scarce or dear this is a *most invaluable adjunct*, as it dispenses altogether with the large quantity of water required by the ordinary method of condensation, and allows the use of a condensing Engine where otherwise it would be impossible to adopt one (for instance, at A. B.s' London Works). By this method, only so much water is lost by evaporation from the outside of the pipes as is equivalent to that which is gained by the condensation of the escaping steam within; and practically, little more water is required for working this apparatus than would be used by an ordinary high-pressure engine of equal power, because the same condensed water is worked over and over again, and returned each time to the boiler in a heated state, but of course considerably below boiling point.

The apparatus may be fixed at any distance from the Engine—on the roof of a building or in any other outside place—as may be most convenient, and the more exposed the better, without in any way affecting the vacuum, which can be maintained steadily at about 25 inches or more.

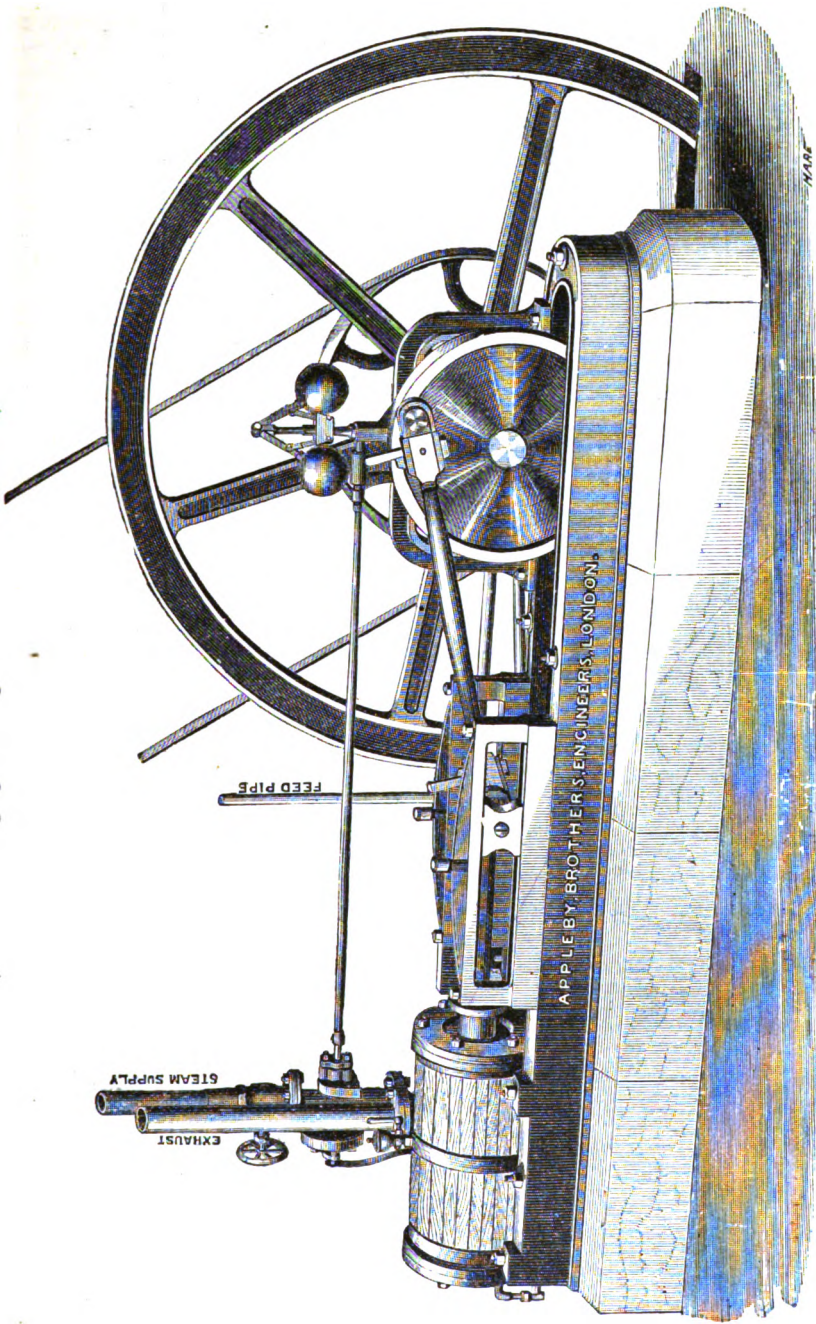
The steam to be condensed is carried from the exhaust into a coil box, in an elevated and exposed place, and thence spreading itself through a series of horizontal copper pipes is condensed by a shower of water (which need not even be cold) that is caused to flow over the exterior of the pipes by means of a copper serrated trough at the top, and the whole of the water then flows back to the pump and is pumped again into the boiler; this process is continued as long as the Engine is at work. Ample provision is made for the expansion of the pipes without disturbance to the joints.

Messrs. APPLEBY BROTHERS have this form of Condenser in constant operation at their Works, both in London and Leicester, and will be glad to show it to intending purchasers and give prices for applying it.

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

HORIZONTAL HIGH-PRESSURE AND CONDENSING ENGINE

(From a Photograph of Engine with 12-inch Cylinder).



The principle of this Engine is DIRECT ACTION, the working parts are easy of access, and are secured to a strong metal Foundation Plate, provided with bolts and nuts for fastening to stone, or brickwork, or wood framing.

The Cylinder has turned flanges, bright polished cover, metallic piston with steel segment, brass tongues, and steel springs, piston rod of best cast-steel, bright cross-head, cross-shaft with blocks lined with gun metal, two sets of slide bars planed and scraped, crank shaft of best hammered scrap iron, working in gun-metal bearings, bright turned connecting rod with gun-metal head, &c., polished gun-metal eccentric strap, with bright rod fitted to valve motion, force pump with gun metal clacks

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FIXED HORIZONTAL HIGH-PRESSURE STEAM ENGINE, WITH CYLINDRICAL CORNISH BOILER—continued.

and seatings, air vessel and covers, easily accessible, bright governors and levers, heavy fly-wheel accurately balanced and turned on the edge for a strap if necessary. The steam is supplied from a CYLINDRICAL CORNISH BOILER, of ample size and strength, with one tube (or in the larger sizes *two* tubes) through the whole length, made of best materials and tested to a high pressure, and fitted with patent steam gauge, water gauge and cock, safety valve, blow-off cock, furnace door, fire bars, bearer and dead plate, and every necessary for the safe, efficient, and economical working of the whole. The annexed prices include all complete to the end of fly-wheel shaft, but exclusive of pipes to connect Engine and Boiler (which will vary according to the distance apart):—

Horse-power of Engine	4 H.-p.	6 H.-p.	8 H.-p.	10 H.-p.	12 H.-p.	16 H.-p.	20 H.-p.	25 H.-p.	30 H.-p.	35 H.-p.	40 H.-p.	50 H.-p.
Diameter of Cylinder	6½ in.	8 in.	9 in.	11 in.	12 in.	14½ in.	16 in.	18 in.	20 in.	21 in.	22 in.	24 in.
Price of Engine only	£ 53 10	£ 77 0	£ 100 0	£ 119 0	£ 141 0	£ 190 0	£ 230 0	£ 318 0	£ 370 0	£ 420 0	£ 475 0	£ 590 0
Price of Feed Pump, EXTRA	4 0	5 5	6 5	7 5	8 5	9 12	12 12	15 15	18 18	21 21	24 24	30 30
Price of Engine and Cornish Boiler, with Feed Pump and fittings complete, as described	130 10	166 0	214 0	246 0	294 0	390 0	485 0	620 0	725 0	792 0	865 0	1040 0
Price of Expansion Gear, EXTRA .. .. .	..	8 0	10 0	12 0	14 0	16 0	20 0	25 0	30 0	35 0	40 0	50 0
Average Consumption of Common Coal per hour at 45 lb. pressure	32 lb.	42 lb.	56 lb.	70 lb.	84 lb.	112 lb.	136 lb.	172 lb.	205 lb.	..	275 lb.	340 lb.
Average Evaporation of Water per hour at 45 lb. pressure	22 Gals.	30 Gals.	40 Gals.	50 Gals.	60 Gals.	80 Gals.	100 Gals.	125 Gals.	150 Gals.	..	200 Gals.	250 Gals.
Ditto Consumption of Water when ordinary Condenser is added	250 "	380 "	500 "	630 "	750 "	1000 "	1300 "	1700 "	2000 "	..	2500 "	3000 "
Approximate Weight of Engine, packed	18 cwt.	45 cwt.	48 cwt.	50 cwt.	70 cwt.	100 cwt.	115 cwt.	130 cwt.	160 cwt.	..	..	..
Ditto ditto of Boiler and Fittings	26 "	45 "	50 "	57 "	70 "	115 "	120 "	140 "	230 "	..	..	..
Approximate Measurement of Engine when packed, in cubic feet	40 ft.	83 ft.	90 ft.	95 ft.	145 ft.	215 ft.	245 ft.	260 ft.	280 ft.	..	..	..

For EXPORTATION it is advisable to send with each Engine a set of EXTRAS as follows: 2 pairs of main-shaft brasses, 1 set of brasses for large end of connecting rod, 1 set of piston rings and springs, 1 set of eccentric brasses, 1 set of furnace bars for boiler, and 6 gauge glasses and rings.

Link-Motion Reversing Gear can be attached at an extra charge.

Horizontal Engines from 10 horse-power with 2 CYLINDERS, if required. SPECIAL QUOTATIONS GIVEN FOR LARGER SIZES THAN LIST.

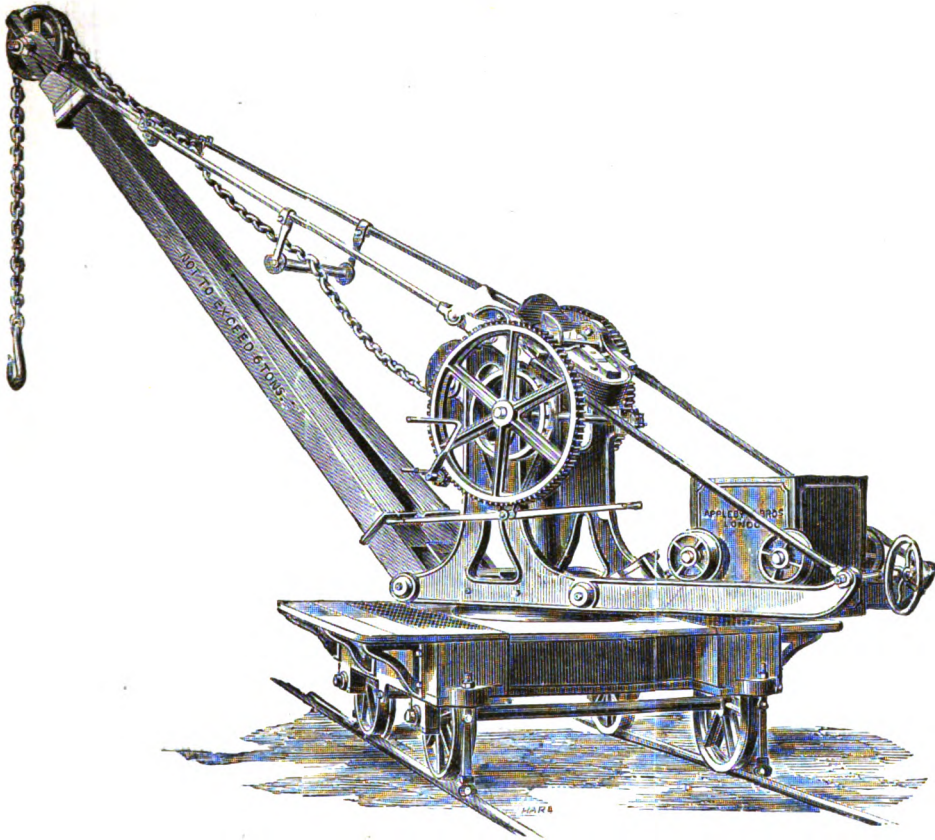
The improved Water-Heater is highly recommended, price extra from £10 to £20. For Engines of more than 30 horse-power two boilers are recommended. Packing for Shipment, 3 per cent.

APPLEBY BROTHERS,

ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

PORTABLE HAND CRANE,

GOVERNMENT PATTERN. No. 1.



These Cranes are constructed to work loads varying from 1 to 10 tons, and can be adapted to work on any gauge of Railway. They are used by Her Majesty's Government and the Indian Government, as well as by many of the leading Railway and Dock Companies.

The Base Plate is in one massive casting, chequered on the top, and of sufficient size to allow the men to work at whatever angle the Crane may be. The Crane Post is of hammered iron; all the Wheels and Pinions are lined up to their pitch lines, the Pinions being thrown in and out of gear by *clutches*; the Journals are of great length, the Shafts run in gun-metal bearings, and the working parts throughout are accurately fitted and carefully finished.

The Balance Weight Box is of ample size, and is moved along the tail pieces by a traversing screw worked by a hand wheel. There is a Friction Roller to take the weight off the back balance and reduce friction when turning. The Engraving shows a Crane of the 6-Ton size.

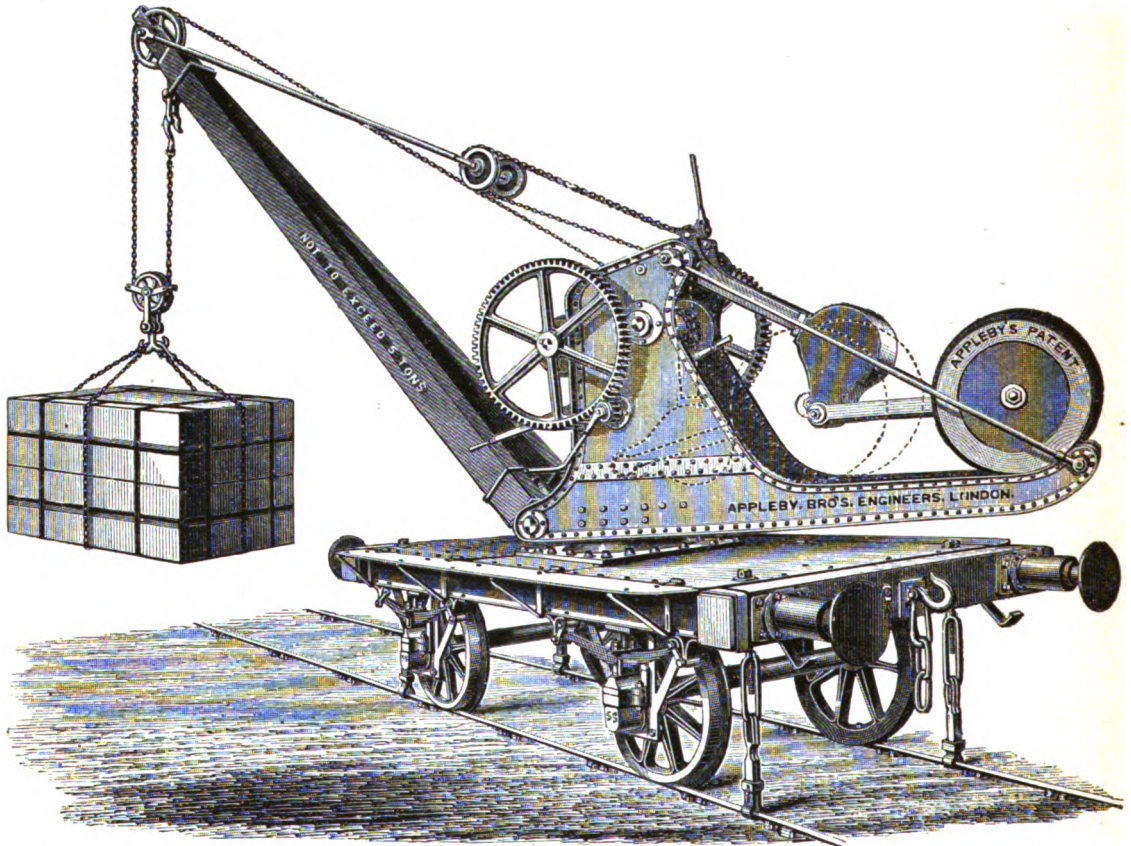
Special designs and estimates will be given for *Permanent-way* and "*Accident Cranes*" for Steam or Hand Power, to run with ordinary stock, with or without Tenders, complete with Jacks, Packings, and Tool Chests, &c.

To lift	3 Tons	..	..	Price	£165 approx.	weight	4½ tons.
"	5 "	..	..	"	£255	ditto	
"	6 "	..	..	"	£320	ditto	
"	10 "	..	..	"	£425	ditto	

APPLEBY BROTHERS,
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.

PORTABLE PERMANENT-WAY CRANE, WITH PATENT SELF-ACTING BALANCE.

No. 6.



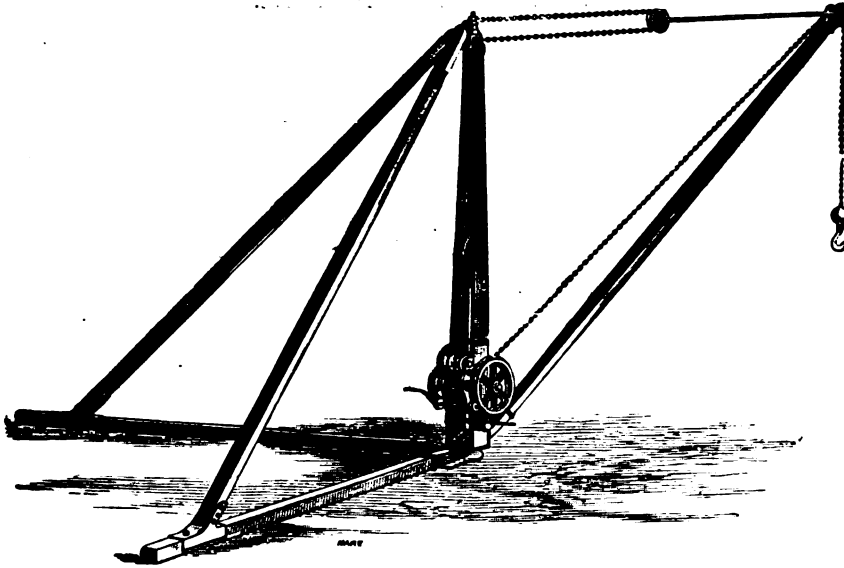
The object attained by this invention ensures the stability of the Crane when working up to its maximum power on narrow-gauge lines, and reduces the strain on the crane. The counter-balance is obtained by a revolving self-acting counter-balance running out to an extent proportionate to the load being lifted, as is shown in the engraving; and when the load is removed the balance weight returns to the position indicated by the dotted lines.

The side frame and under carriage are usually constructed of wrought iron, so as to reduce to a minimum the risk of breakage to which Cranes of this type are so liable; and, if required for running with ordinary rolling stock, they are fitted with springs, buffers, axle boxes, couplings, and all appliances for that purpose, and with apparatus for altering the radius of the jib, and for lowering it when travelling.

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HAND DERRICK CRANE.

No. 1.



Being moderate in first cost, easily moved, and requiring no support from buildings, or great care in fixing, these Cranes are extensively used in stone yards, in constructive operations, and generally in situations where a great height of lift and varying radius is required. They are made to swing round about three-fourths of a circle. The gear is fixed at a convenient height for turning, and the chain passes direct from the lifting barrel over a pulley in the jib-head casting. The radius of the jib is varied by turning the Derrick Barrel, from which a chain runs between the upright posts over a pulley at the top, as shown above, and the arrangement is such that the load lifted nearly or quite counterbalances the strain on the gear, so that little harm can result from careless working.

The subjoined Prices include single and double purchase lifting gear with strap brake, and lever, two handles, the safety Derrick motion described above, the whole of the timbers shown, with all necessary shoes and ironwork, together with chain to reach to the ground line.

To lift	1 Ton.	2 Tons.	3 Tons.	4 Tons.	6 Tons.	8 Tons.	10 Tons.
Sweep 25 ft. ..	£47	—	—	—	—	—	—
„ 30 „ ..	£53	£64 10s.	£85 10s.	£102 10s.	£139	£188	£235
„ 35 „ ..	—	10s.	£92 10s.	£109 10s.	£148	£199	£248

wheels and Pinions are lined

clutches the Journals are of

STEAM DERRICK CRANE, WITH BOILER COMPLETE.

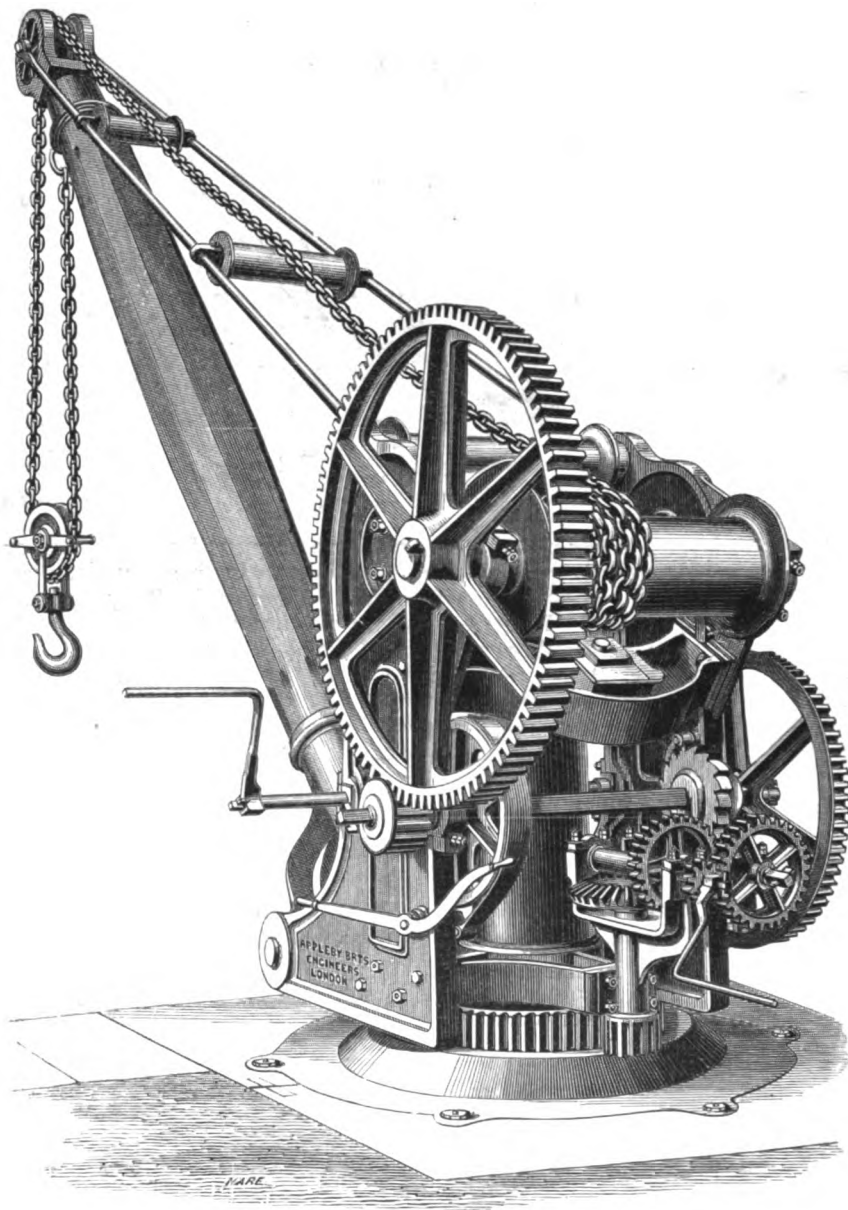
To Lift Loads.	Sweep of Jib.	To Lift Loads.	Sweep of Jib.	To Lift Loads.	Sweep of Jib.	To Lift Loads.	Sweep of Jib.
2 Tons.	25 feet.	3 Tons.	25 feet.	5 Tons.	25 feet.	10 Tons.	25 feet.
1½ „	30 „	2½ „	30 „	4 „	30 „	8 „	30 „
1¼ „	35 „	2¼ „	35 „	3 „	35 „	6 „	35 „
Price £200		Price £250		Price £330		Price £490	
Extra if with							
Slewing	£17 10s.	£17 10s.		£20		£25	
Motion							

With Coal at 21s. per ton, and Driver at 5s. per day, the working expenses will be about 10s. per day, and one Steam Derrick will do the work of six Hand Derricks.

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HAND WHARF CRANE.

No. 5A, TO LIFT 20 TONS.



With wrought-iron post, slewing motion, chains, handles, &c., complete as shown. Or with wrought-iron jib.

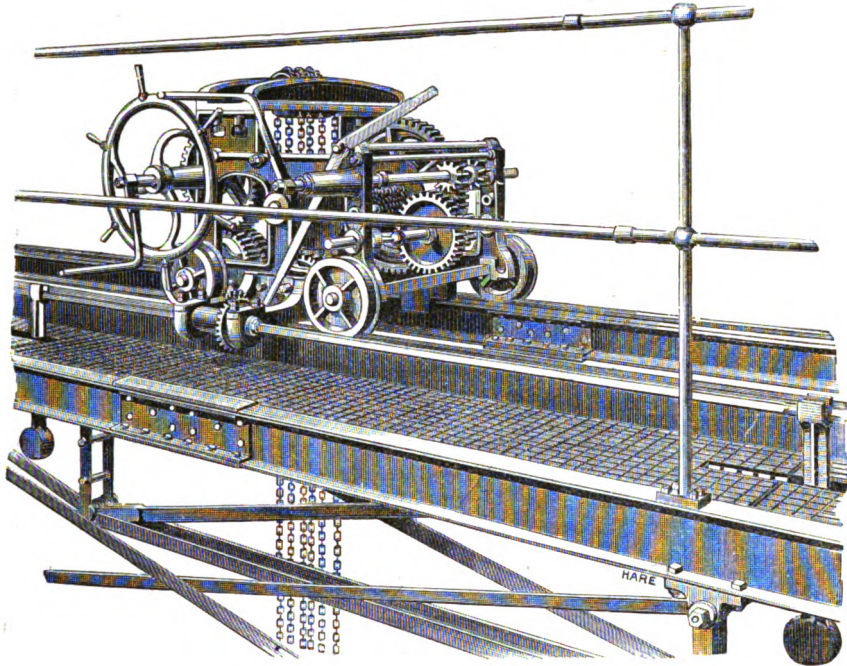
Cranes of this description are made in all sizes, to lift from 2 tons to 30 tons.

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HAND OVERHEAD TRAVELLING CRANES.

No. 9.

These Cranes are fitted with very strong Crabs, having cast-iron sides. The gearing is of the best form for strength, safety, and noiseless working; the lifting motions are single and double purchase, and work through blocks and chains as shown; there is a pawl wheel and pawl to hold the load suspended, and also a powerful strap brake; all the motions are given by the attendant from the Crab without change of clutches, moving levers, or slipping shafts; all motions are therefore constantly in gear, and can be worked alternately or



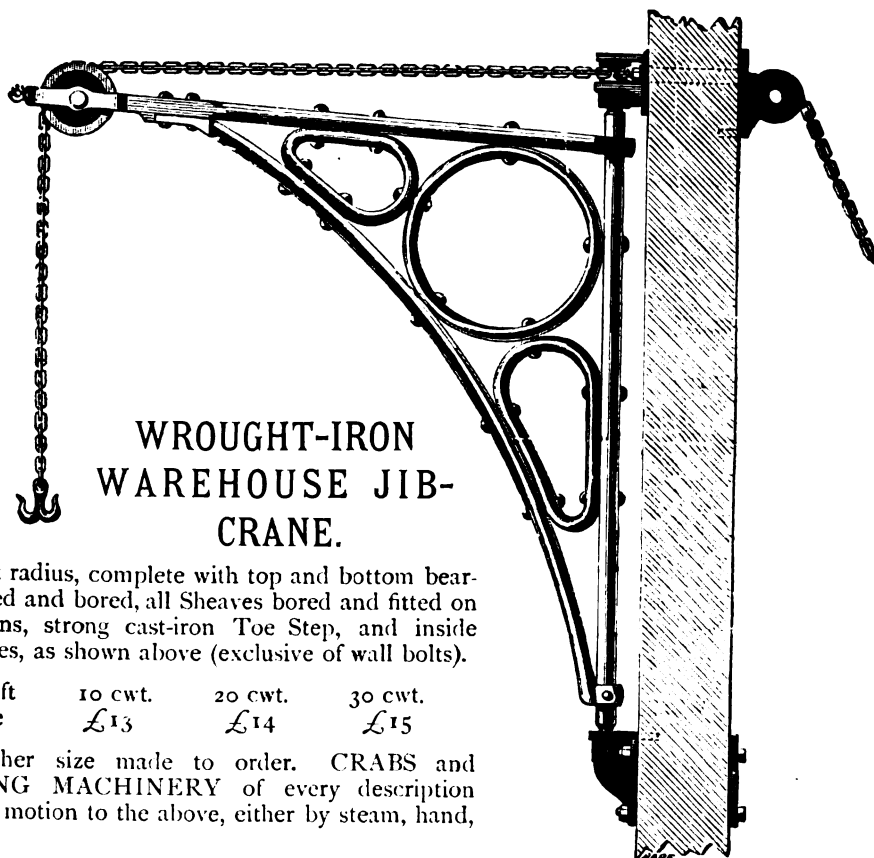
together by the attendant at the Crab. The end cradles or carriages are each in one hollow casting, with the necessary brackets cast on to it for receiving the travelling axles and girders,—the travelling wheels and gear being inside the hollow part of cradles; the travelling wheels are double flanged, and a spur ring is cast on two of the wheels; the travelling motion is given (from the Crab) by pinions gearing into the spur rings, and attached to each end of the tumbler shaft, and the whole of the motions are very quick and handy. The man-stand, or platform with handrail, *extends the full width of the gantry*, and is carried by a light additional girder, which is connected to the main girder by transverse braces at intervals, and the foot plate consists of an open trellis grating which allows the attendant to see through it the exact position of the work below. The whole is fitted together in the most careful manner and of the best material, and the strains and strengths are calculated with an ample margin for safety in working. Chains for a 15-feet lift are included. A Traveller of this type can be seen in daily use at Messrs. APPLEBY BROTHERS' Works, Emerson Street, S.E.

PRICES FOR HAND TRAVELLERS OF 40-FEET SPAN.

To Lift	With Wood Girders.	Iron Lattice-Girders, as No. 9.	Rivetted Plate-Girders.
3 Tons	£ 130	£ 170	£ 190
5 "	170	215	235
10 "	205	275	300
15 "	265	350	380

Special quotations given for different spans and larger or smaller sizes.

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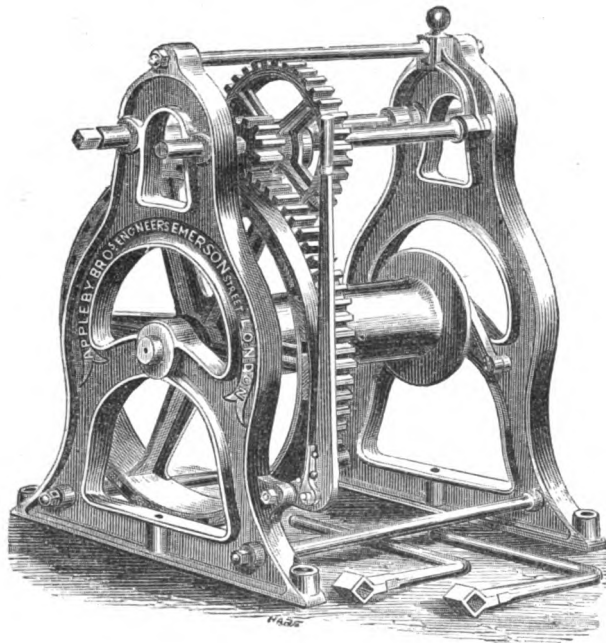
WROUGHT-IRON WAREHOUSE JIB- CRANE.

Six feet radius, complete with top and bottom bearings turned and bored, all Sheaves bored and fitted on turned pins, strong cast-iron Toe Step, and inside Wall Plates, as shown above (exclusive of wall bolts).

To lift	10 cwt.	20 cwt.	30 cwt.
Price	£13	£14	£15

Any other size made to order. CRABS and HOISTING MACHINERY of every description for giving motion to the above, either by steam, hand, or power.

No. 3. "GOVERNMENT PATTERN" STRONG CRAB, OR WINCH.



The shafts are turned throughout and the bearings are accurately bored; the subjoined prices include handles, strap break lined with hard wood, break lever, pawl wheel and pawl for holding the load suspended.

The proportions throughout are ample for working the load specified, with 2 and 3 sheave blocks, and they will lift greater weights with pulley blocks, in proportion to the number of sheaves used.

To lift	price	£	s.	d.
To lift 3 tons, price	10	15	0
Weight about 5¾ cwt.				
Ditto, 5 tons, price	13	10	0
Weight about 8¼ cwt.				
Ditto, 10 tons, price	22	0	0
Weight about 14 cwt.				
Ditto, 15 tons, price	32	10	0
Weight about 21¼ cwt.				

With capstan ends or "fleeting barrels" extra for each end, 18s.

With gun-metal bearings for the first and second motion shaft, extra 40s., 40s., 47s., 52s.

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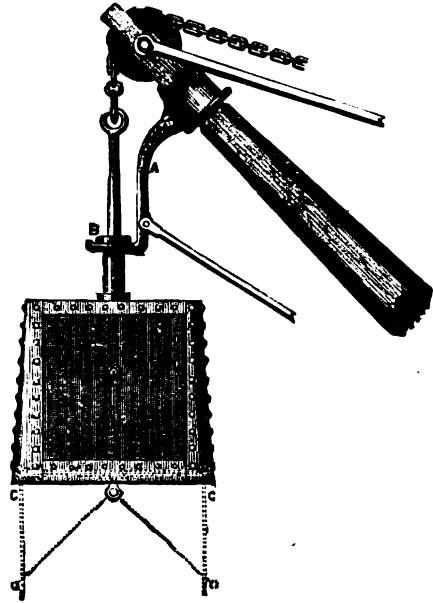
MURRAY'S PATENT SKIPS.

APPLEBY BROTHERS, SOLE PROPRIETORS AND MANUFACTURERS.

These Skips are made throughout of wrought iron, and of any required shape or size. They have been specially designed for lifting ballast, corn, coal, or other materials, and their principal advantages over the Skips ordinarily in use are: 1st. Greater safety in working. 2nd. Greater expedition in discharging. 3rd. That they can be discharged without manual labour at any height or depth. 4th. That they will stand in any position where they are left.

The mode of working the Skip is as follows: A light rod from the fork A is carried to the attendant's hand, and when the Skip is in the proper position the fork A is thrown under the flange B and the chain is slacked; the doors forming the bottom of the Skips then fall down and assume the position shown in the dotted lines C C, when the contents of the Skip are instantaneously discharged. When the fork is drawn back, the doors (forming the bottom) close, and they will obviously remain closed so long as the Skip is suspended (unless they are purposely opened), or when it is deposited on the ground.

FOR LAYING CONCRETE UNDER WATER this apparatus is invaluable. A pair of light doors fitted to the top of the ordinary Skip convert it into a *close box*, in which the concrete is lowered undisturbed by currents to any required depth, and by this means concrete can often be put down in situations where, without such appliances, expensive "boxes" or dams would be indispensable. For this purpose a light chain or rope is used instead of the fork A: one end is made fast to the jib head, and the other end to the flange B. The length of this chain or rope is of course regulated by the depth of working, and when this depth is reached the contents of the Skip are discharged in the same way as if the fork were thrown under the flange. If the jib is "radiated" or swung at the same time as the contents are being discharged, the concrete can be levelled at any depth as well as if "trimmed" by hand.



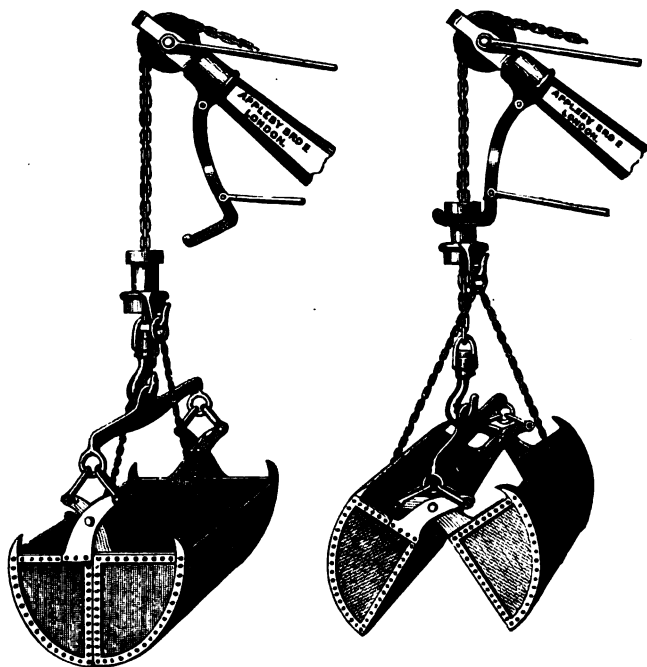
PRICES OF MURRAY'S PATENT SELF-DISCHARGING SKIPS.

To hold, cubic yards	$\frac{1}{4}$ yd.	$\frac{1}{2}$ yd.	$\frac{3}{4}$ yd.	1 yd.	1 yd.	1 yd.
Ditto, cubic feet	6 $\frac{3}{4}$ ft.	9 ft.	13 $\frac{1}{2}$ ft.	18 ft.	20 $\frac{1}{4}$ ft.	27 ft.
Ditto, cwt. of earth (about) ..	6 $\frac{1}{2}$ cwt.	8 $\frac{3}{4}$ cwt.	13 cwt.	17 $\frac{1}{4}$ cwt.	19 $\frac{1}{2}$ cwt.	26 cwt.
Price, each	£8 8s.	£9 10s.	£10 15s.	£12 15s.	£15	£18

SHIFTING HOOK and ROD for working the Skips, as shown in the engraving, £3 10s.

APPLEBY BROTHERS,

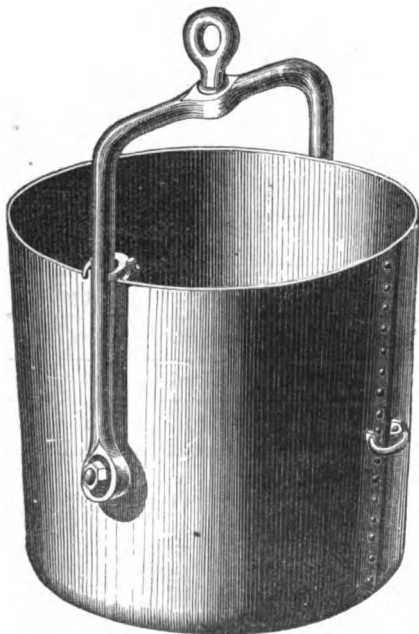
ENGINEERS, EMERSON STREET, SOUTHWARK, LONDON, S.E.



WOODFORD'S PATENT SELF-DISCHARGING SKIPS

Are of wrought iron with circular bottoms, which discharge their load when the chain is slacked out, in the same manner as described for "Murray's Patent Skips," and as here shown.

To hold, cubic yards	$\frac{1}{4}$ yd.	$\frac{1}{2}$ yd.	$\frac{3}{4}$ yd.	1 yd.	1 yd.	1 yd.
Ditto, cubic feet	6 $\frac{1}{2}$ ft.	9 ft.	13 $\frac{1}{2}$ ft.	18 ft.	20 $\frac{1}{2}$ ft.	27 ft.
Ditto, cwt. of earth (about) . .	6 $\frac{1}{2}$ cwt.	8 $\frac{1}{2}$ cwt.	13 cwt.	17 $\frac{1}{2}$ cwt.	19 $\frac{1}{2}$ cwt.	26 cwt.
Price, each	£8 8s.	£9 10s.	£10 15s.	£12 15s.	£15	£18



STRONG ROUND WROUGHT-IRON CONTRACTOR'S SKIP.

With swing handle and catch.

To hold, cubic yards	$\frac{1}{4}$ yd.	$\frac{1}{2}$ yd.	$\frac{3}{4}$ yd.
With PLAIN BALE, each	£4 17 6	£6 10 0	£7 10 0
With SWIVEL BALE, as shown in the Engraving, extra	0 4 0	0 5 0	0 5 0

CONTINUED.

To hold, cubic yards	$\frac{1}{4}$ yd.	$\frac{1}{2}$ yd.	1 cubic yd.
With PLAIN BALE, each	£9 10 0	£10 10 0	£12 10 0
With SWIVEL BALE, as shown in the Engraving, extra	0 6 0	0 7 6	0 7 6

Note.—Half a ton of small coal requires a three-quarter-yard Skip.

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